



NATURAL RESOURCES

Photo credit: Colin McDonald



Kelly McKnight, left, of the Trinity River Authority discusses the results of a Texas heelsplitter survey in Lake Livingston with graduate student Dustin Esmond of the University of Texas at Tyler. The survey was part of a mussel survey blitz across the Sabine, Neches, Angelina and Trinity river basins.

More Mussels, More Questions:

Surprise Discovery of Rare Mussel in Urban Canal Spurs New Surveys in Quest to Document Species Status.

by Colin McDonald

According to biologists and wildlife agencies, the rare and state-protected Louisiana pigtoe mussel was not supposed to live in the supply canal of the Lower Neches Valley Authority (LNVA).

The U.S. Fish and Wildlife Service (FWS), which is considering listing the species under the Endangered Species Act (ESA), says, "The Louisiana pigtoe occurs in only stream and river habitats with low to moderate flow on substrates of sand, silty sand, sand and gravel, and sand and clay."

However, in late July 2019, during scheduled maintenance and dewatering of a 2.5-mile canal section, LNVA relocated over 100 Louisiana pigtoes along with more than 13,000 common mussels. (It was an unprecedented discovery.)

"It gives you pause when you realize how little is known about these obscure species," said LNVA General Manager Scott Hall.

As microscopic youngsters, Louisiana pigtoes attach to fish that serve as hosts until the baby mussels, or glochidia, grow large enough to detach and settle into their adult lives as bottom dwelling filter feeders. The precarious life cycle makes survival of young to adulthood extremely rare, and any change to fish behavior or water quality could stop or reduce reproduction.

Biologists usually take kayaks or jet boats to explore remote sections of East Texas rivers

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THE COMPTROLLER'S ROLE IN SPECIES RESEARCH

For the last decade, the Texas Legislature has directed the Comptroller's office to take a leadership role in endangered species issues.

The **Natural Resources Program** provides technical, scientific and policy expertise to help communities and businesses comply with **Endangered Species Act (ESA)** regulations. The program also develops ecological research that directly informs ESA listing decisions and voluntary conservation options. We work collaboratively with diverse stakeholders to find solutions to ESA challenges that are sustainable ecologically, socially and economically.

“When you have a species that is potentially going to be listed and it is right in the middle of everything you do day in and day out, it becomes imperative to understand its life cycle.”

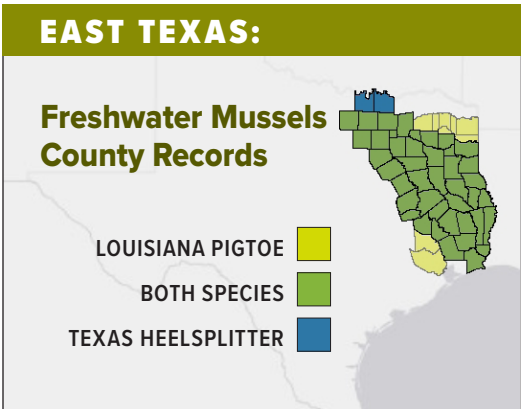
to find a few dozen. The latest habitat models and estimates did not consider the muddy canal less than a mile from urban areas as potential habitat.

This discovery could prove to be central to FWS’ review of the pigtoe. It provides more information about species distribution and habitat associations. Moreover, it demonstrates potential approaches to species propagation. It also presents a challenge for the LNVA. If the FWS lists the species, the river authority faces the possibility of needing FWS approval for some aspects of its operational plans. In addition, because the species is already state listed as threatened, LNVA may need to consult with the Texas Parks and Wildlife Department.

“The whole process was a bit overwhelming,” LNVA General Manager Scott Hall said about the sudden matrix of ESA regulatory impacts he could face. “When you have a species that is potentially going to be listed and it is right in the middle of everything you do day in and day out, it becomes imperative to understand its life cycle.”

Formed in 1933, the LNVA is one of the oldest river authorities in Texas. It has weathered the Great Depression, hurricanes and droughts. Its staff does everything from flying drones to culling alligators to keeping up to 1 billion gallons of water a day flowing to 8 cities, 26 industries and more than 100 irrigated farms spread across a 400-mile system. The river authority would not sit idly by as the FWS made its listing decision; if the mussels had been missed in the canal, where else were they?

“It gives you pause when you realize how little is known about these obscure species,” Hall said.



The Louisiana pigtoe and Texas heelsplitter occur in streams and rivers in East Texas. This map depicts the range of both species by county. The species occupy more than 50 eastern counties ranging east-west from the Texas-Louisiana border to Harris County and north-south from the Red River to the Gulf of Mexico.

Working with the Comptroller’s Natural Resources staff, biologists from the University of Texas at Tyler (UT Tyler) under contract with the Comptroller, federal biologists and its own hired dive team, the LNVA became a key player in a two-month mussel survey blitz across East Texas for the Louisiana pigtoe and another rare mussel, the Texas heelsplitter.

The LNVA staff have intimate knowledge of the river system and working relationships with private landowners and federal agencies throughout the basin, so the crews gained access to reaches on the Neches and Angelina rivers that had never been surveyed for either species. UT Tyler followed and went further afield into the Trinity, Sabine and Big Cypress drainages.

Validated with DNA identification, the teams found mussels near dams, in deep water and in places that had been deemed “functionally extirpated.”

The FWS expects to have its Species Status Assessment (SSA) for the Louisiana pigtoe and the Texas heelsplitter completed by the end of 2019. The SSA serves as the scientific basis for federal listing decisions.

No matter the outcome, the LNVA now has useful information about the species living in its basin and a seat at the table for discussions with FWS about if and how the species and habitat should be protected. ■

EAST TEXAS FRESHWATER MUSSELS PETITIONED FOR ESA LISTING:	
LOUISIANA PIGTOE	TEXAS HEELSPLITTER
<i>Pleurobema riddellii</i>	<i>Potamilus amphichaenus</i>
<ul style="list-style-type: none"> • Range: East Texas, Western Louisiana and Southern Arkansas 	<ul style="list-style-type: none"> • Range: East Texas and Western Louisiana
<ul style="list-style-type: none"> • Draft species status assessment expected in 2019 	<ul style="list-style-type: none"> • Draft species status assessment expected in 2019
<ul style="list-style-type: none"> • Federal listing decision expected in 2020 	<ul style="list-style-type: none"> • Federal listing decision expected in 2020

Meet Matagorda:

Engaging Local Knowledge in Ecosystem Research Effort

by Chelsea Jones

It's a sunny, breezy day at Magnolia Beach on the shores of Matagorda Bay. A young man casts from the beach. A couple keeps an eye on their dog while they cruise the beach for seashells. A birder pulls her binoculars up to train her eyes on a lone oystercatcher. Out on the water, a fishing boat cuts across the choppy waves. Every single one of them, while enjoying the warm day, interacts with facets of a large ecosystem.

Matagorda Bay, spanning nearly 30 miles from the mouth of the Colorado River to Paso Cavallo, is a burgeoning ecosystem. Sharks, sea turtles, sportfish and shorebirds are among the many species supported by the unique conditions created within the confines of the Matagorda Peninsula. Here, seawater mixes with freshwaters from the Lavaca-Navidad, Tres Palacios and Colorado watersheds. The gradient from fresh to salty, across shallow waters, creates ideal conditions for oysters and vegetation to grow. In turn, turtles, fish and people alike, cruising around the patchwork of habitats in the bay, find something to enjoy.

In June 2019, the Comptroller's office contracted with Texas A&M University-Corpus Christi and their partners at Texas A&M University, Texas A&M University at Galveston, and BIO-WEST Inc. to pursue a comprehensive study of Matagorda Bay. Dubbed a relatively healthy, undisturbed ecosystem, Matagorda Bay represents a unique opportunity to study ecosystem dynamics on a large scale. The project aims to pool expertise across disciplines to piece together the many facets that represent the health and function of the bay ecosystem. Researchers will focus on seven key tasks to characterize interactions between habitats and wildlife across the bay.

To bolster their datasets, Comptroller staff and university researchers are gathering information from local sources including agencies, businesses, organizations and individuals



Sunrise over Magnolia Beach, along the western shore of Matagorda Bay.

Photo credit: Chelsea Jones

that observe the bay on a regular basis. Local knowledge enables researchers to leverage anecdotal information and utilize existing datasets to characterize the status of the bay.

Regular communication with potential contributors and end-users is crucial to encourage input and maximize the value of

Every single one of them ... interacts with facets of a large ecosystem.

the research project. The Comptroller's office along with its partners hosted the first of a series of public meetings in Palacios, Texas, in September 2019. Over 60 attendees, representing the public and over 25 different organizations, met the people behind the research, learned about the research approach (including the Comptroller's role in endangered species research) and asked questions.

Public participation in ecosystem research promotes high-value research tailored to support diverse communities of end-users. Open dialogue between researchers and community members helps the Comptroller's office stay aware of ongoing information gaps needed to sustain the value of Matagorda Bay. ■

SPECIES HIGHLIGHT

WESTERN CHICKEN TURTLE

by Lauren Borland

The western chicken turtle is an elusive freshwater turtle historically found in ephemeral wetlands dispersed across multiple states, from the Guadalupe to the Mississippi River. They vary from the other two subspecies of chicken turtles, exhibiting an omnivorous diet and an earlier aestivation, or dormancy, period.

Despite its charismatic name, the current distribution and status of the species is not well understood. With sufficient time before the U.S. Fish and Wildlife Service makes a listing decision on the species in 2024, the Comptroller's office has issued a call for proposals to conduct surveys for the western chicken turtle in Texas to address important data gaps. This research is expected to begin in Spring 2020, starting with efforts by the Comptroller's office and researchers to obtain access to private land to carry out surveys.

A western chicken turtle in an ephemeral wetland.



Photo credit: Texas A&M Natural Resources Institute

RECOVERING AMERICA'S WILDLIFE ACT

by Meghan Hope

The Recovering America's Wildlife Act (RAWA) would dedicate \$1.3 billion per year in existing revenue to fund state wildlife action plans. Texas would be eligible for about \$57 million annually to help protect and preserve wildlife and natural resources.

The Comptroller's office collaborates with the Texas Parks and Wildlife Department to gather sound science on rare species in Texas. The RAWA would allow this partnership to leverage federal funding to expand ongoing research to protect the state's economic health and biodiversity.

Stay up to date on this pending federal legislation at <http://txwildlifealliance.org/>.

Photo credit: Lauren Borland



RAWA could benefit many species and landscapes, including the Katy Prairie.

RESEARCH IN PROGRESS: TEXAS KANGAROO RAT

Photo Credit: Texas Tech University



The Texas kangaroo rat is currently only found in five North Texas counties.

by Colin McDonald

The Texas kangaroo rat is not a kangaroo or a rat, but it is a Texan and does not appear to be doing well.

The small mammal is in the Heteromyidae family and is more closely related to gophers than kangaroos or rats. It is currently only found in five counties: Cottle, Childress, Hardeman, Wilbarger and Wichita at the base of the Texas Panhandle along the Red River. It once occupied more than 20 counties.

Although naturalist C. Hart Merriam first described the species in 1894, we still know very little about its habitat needs or range. Most of all, we do not know why it seems to be disappearing.

Armed with modern tools like smart phones and drones, researchers at Texas Tech University are taking a new approach to understanding this mysterious mammal.

Like a hawk scanning for its next meal, the drones fly slowly overhead scanning the ground to produce high-resolution images. When combined with data sets like soil types, ground-penetrating radar and topographic information, computers can then predict and detect where the kangaroo rats have made their burrows.

If this approach can be scaled up to the county level, it may be possible to track the remaining population and answer questions like what it needs and how to protect and improve its habitat. ■

WINTER 2020 WEBINARS

PLAINS SPOTTED SKUNK

Catch updates on active research taking place in the Katy Prairie.

TEXAS KANGAROO RAT

Texas Tech University researchers recap the trials and technology involved in six years of research.

MATAGORDA BAY RESOURCE SERIES

Spotlighting one of many ecological and economic resources of Matagorda Bay.

WE ARE HERE

For more information, including research updates, project reports and meeting announcements, explore our website or follow us on social media.



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Research endangered species documents on the **FEDERAL REGISTER** website.

<https://www.federalregister.gov/endangered-threatened-species>

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